

Identifying and Using a Teacher-Friendly Learning-Styles Instrument

JOSEPH PITTS

Abstract: This study assesses the validity and reliability of the Learning Styles Preference Indicator (LSPI), an instrument developed by the author. The LSPI identifies students' preferences for analytical or global approaches to learning new and difficult material. This instrument is easy to administer, quick to score, and produces information that will help teachers understand the way their students process information. By using information from the LSPI, teachers can design more appropriate learning strategies for the benefit of each student. This article reports reliability and validity correlation scores for elementary through adult students.

Keywords: analytical learner, global learner, information processing, learning styles

Educators and researchers have long been concerned with identifying how individuals learn. Even before the 1970s, scholars have known that matching teaching styles and learning styles would result in improved classroom grades, which logically reflect greater learning. Understanding learning styles can help educators facilitate, structure, and validate successful learning for all students (Guild and Garger 1998). Sims and Sims (1995) point out that researchers have learned a great deal over the last fifty years about learning styles and how identifying and teaching through learning styles can improve students' test scores and increase content knowledge. Dunn and Dunn (1992) demonstrate that when students are taught using their preferred learning styles, they show increased academic achievement, improved attitudes toward instruction, and better discipline than when they are taught using their nonpreferred styles. Further

research substantiating these claims can be found at <http://www.learningstyles.net>.

To produce these benefits and increased content knowledge, however, teachers must be able to identify their students' preferred learning styles in an efficient manner. The problem has been that instruments often require more time to administer, score, and implement than many teachers are willing to give. I thus developed the Learning Styles Preference Indicator (LSPI) to provide teachers with a quick and efficient way to identify analytical and global learners. Once these learners have been identified, teachers will be able to teach to the students' styles, and students' learning will reflect those accommodations.

Emergence of Learning-Styles Instruments

A background review of learning-styles instruments and research is a useful place to begin. Research on learning and cognitive styles evolved from psychological research on individual differences (Curry 1987). In the process, scholars began to develop inventories and other measures to identify the learning styles they discovered. At the beginning of the 1990s, at least thirty-two commercially published instruments that assess the different dimensions of learning styles were in use (Campbell 1991). In the last two decades, many more inventories have been developed. As Sims and Sims (1995) point out, however, common problems in this research and these inventories include the development of an acceptable definition of learning styles and ways to identify learners.

Defining Learning Styles

Confusion about terminology abounds in learning-styles research. One article reports approximately 127

*Joseph Pitts, PhD, is the director of Middle Level Programs at Converse College, Spartanburg, SC.
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different factors identified by researchers as contributing to learning styles (Hoagies' Gifted Education 2006–7). Moreover, different researchers identify learners in different terms. In *Learning Style Perspectives*, Sarasin (1999) reviews five sets of researchers and the ways they identify learners:

1. Gregorc and Butler identify learners as *concrete*, *abstract*, *sequential*, and *random*. Concrete learners need to be involved in learning a concept in a physical way. As much as possible, they require concrete objects or manipulatives to make learning real for them. Abstract learners are precise and attentive to details, synthesizing pieces of data to understand the whole. Sequential learners are structured and ordered, requiring the delineation and explanation of specific details and concrete steps. Random learners cannot operate in a structured way in learning situations; instead, they learn from the whole to the parts. Gregorc and Butler believe that everyone can be classified into one or a combination of these styles.

2. Sims and Sims identify learners as *cognitive*, *perceptual*, *behavioral*, or *affective*. A cognitive learner needs to understand the parts of a new concept before comprehending the whole and requires adequate thinking time and an ordered pattern for thinking. A perceptual learner looks at a concept and analyzes its pieces holistically, relying on visual aids to see the whole picture. A behavioral learner needs to move and be physically involved in learning to absorb a new concept. An affective learner learns through feelings and emotions.

3. McCarthy identifies learners as *analytic*, *imaginative*, or *dynamic/common sensible*. Analytic learners process information in pieces. They work best with facts and individual pieces of data that they can put together to form a whole. Imaginative learners create a visual image, such as a chart, graph, or diagram, to learn. Dynamic/common sensible learners require an active approach. Practical by nature, they learn best by interacting with the information at hand.

4. Harb, Durrant, and Terry identify learners as *reflective/abstract*, *concrete*, or *active*. Reflective/abstract learners need to ponder information and consider the relationships, connections, and influences among the different pieces. Concrete learners require a visual aid to understand a concept globally. Active learners must control their learning to make sense of information for themselves. They relate it to their experiences or personal understanding so that they can process the information in a way that makes sense to them.

5. Sarasin identifies learners as *auditory*, *visual*, or *tactile/kinesthetic*. Auditory learners need an oral presentation of information. Visual learners need visual aids—drawings, charts, diagrams, outlines, or even mental images—to make sense of new information. Tactile/kinesthetic learners learn by doing and use physical activity to understand new material.

Although many similarities exist among the styles described by Sarasin—and these five examples are only a fraction of the list—each author assigns a different name to each style. With so many different ways to identify learners, it is no wonder that many teachers hesitate to try to identify the different styles in their classroom.

Identification of Learners: Learning-Styles Instruments

In an effort to order these different classifications, Curry (1987) organized a three-layer system composed of twenty-one learning-styles instruments (see table 1; three instruments do not fall into any category and are not included here). The first level presents learning behavior as the central dimension of personality and emphasizes instructional and environmental preferences. The second level centers on information-processing dimensions. The third level presents instructional preferences that are influenced by personality-related preferences. This last level, the instructional preference learning-style conceptual approach, interacts most directly with learning environments, learner expectations, teacher expectations, and other external factors and is the easiest to observe.

Hickcox (1995) describes eighteen of these twenty-one inventories. These inventories, as valuable as they may be, use too much classroom time. For example, the Canfield and Lafferty Learning Styles Inventory comprises 120 self-report rank-order items; furthermore, when Curry ran psychometric tests on this inventory, it showed poor reliability and poor validity (Sims and Sims 1995). Similarly, Goldberg's Oregon Instructional Preferences Inventory consists of eighty-two items in a two-alternative, forced-choice format; this inventory demonstrated only fair reliability and poor validity (Sims and Sims 1995). Hill's Cognitive Style Interest Inventory is composed of 216 items, each involving a three-point Likert-type scale. No psychometric ratings for either reliability or validity have been conducted (Sims and Sims 1995). The Dunn, Dunn, and Price Learning Styles Inventory for grades 5–12 has demonstrated good reliability and validity, but it encompasses 104 Likert-type scale items (Sims and Sims 1995).

Of the eighteen inventories described by Hickcox, several have fewer items. For example, the Friedman and Stritter Instructional Preference Questionnaire contains only forty self-report items (Sims and Sims 1995). Even the shorter instruments, however, use Likert-type scales to describe student preferences, which require more time than *yes* or *no* questions. These instruments cannot be either administered or scored in a short period of time. Teachers need an instrument that can identify the most important learning styles and is quick, easy to score, and teacher friendly.

TABLE 1. Curry's Classification System of Learning-Styles Instruments

Level	Author	Instrument
1: Instructional and environmental preferences	Canfield and Lafferty	Learning Styles Inventory
	Dunn, Dunn, and Price	Learning Styles Inventory
	Friedman and Stritter	Instructional Preference Questionnaire
	Goldberg	Oregon Instructional Preferences Inventory
	Grasha and Riechmann	Student Learning Interest Scales
	Hill	Cognitive Style Interest Inventory
2: Information-processing preferences	Renzulli and Smith	Learning Style Inventory
	Rezler and Rezmovic	Learning Preference Inventory
	Biggs	Study Process Questionnaire
	Entwistle and Ramsden	Approaches to Studying Paragraph Completion Method
	Hunt	Learning Styles Inventory
	Kolb Reinert	Edmonds Learning Style Identification Exercise
3: Personality-related preferences	Schmech, Ribich, and Ramanaih	Inventory of Learning Process
	Schroeder	Paragraph Completion Test
	Kagan	Matching Familiar Figures Test
	Myers	Myers-Briggs Type Indicator
	Witkin	Embedded Figures Test

Source: Curry 1987.

Developing a Reliable and Valid Teacher-Friendly Inventory

In a recent review of the current learning-styles research, Dunn et al. (2009) conclude that

exposure to learning style requires recognition of the need for diverse strategies designed to complement individual differences. As a result, teachers make a concerted effort to eradicate the one-size-fits-all approach and acknowledge the need to modify their classrooms, instructional practices, and assessments . . . Educational stakeholders recognize that these modifications are essential for academic success. (138)

The real purpose of using a learning-styles instrument is to most effectively differentiate instruction; once a teacher identifies students' approaches to learning as global or analytical, the teacher can then implement different strategies to benefit the different learners. As Dunn et al. point out, "Differentiated instruction has become part of every school system's lexicon but

without learning styles as its cornerstone, no one knows how to differentiate instruction or on what to base differentiation" (2009, 139).

I developed the LSPI using research conducted by Dunn and Dunn (1992), who classify individuals as *analytical* or *global* learners. Dunn and Dunn found that analytical learners are more successful when information is presented step-by-step in a cumulative, sequential pattern that builds toward a conceptual understanding (i.e., a part-to-whole pattern of learning). These individuals prefer to learn in a quiet, well-illuminated, formal setting; often have a strong emotional need to complete tasks; like to learn alone or one-on-one with a teacher; prefer highly structured assignments; and rarely eat, drink, smoke, chew, or bite on objects while learning. Global learners have the opposite set of characteristics, learning more easily when they master a concept first and then concentrate on the details. These individuals work well and concentrate better with distractors such as

sound, soft lighting, an informal seating arrangement, and some form of intake (e.g., eating or drinking). They take frequent breaks while studying and often work on several tasks simultaneously. Global learners prefer to work with their peers and structure tasks in their own way (Dunn and Dunn 1992).

I developed an instrument to quickly assess these two major learning-styles elements. The LSPI is composed of fifteen questions, each with two choices for the response. The A column represents a preference for an analytical approach, while the B column represents a global approach to learning new and difficult material (appendix A). Using a data sheet to record student responses, teachers could then identify each student as an analytical or a global learner.

Determining Reliability and Validity of the LSPI

To test reliability, forty elementary and middle school teachers were asked to administer the LSPI in January and then again in April. Before the students completed the assessment, teachers read the directions aloud.

A total of 1,098 randomly selected student volunteers were used to determine whether the LSPI's results were consistent over time and whether the instrument assessed the attributes it was intended to measure. The sample population encompassed a wide range of abilities and ages, from grade 2 to adult. All students were located in north central South Carolina. Of the fifty-seven adult students in the sample, twenty-four were working on a master's degree and thirty-three were working on a bachelor's degree or an initial certification. The grade-level students came from either the classes of the adults in the study or other classes to which I had access.

Results

To test reliability, correlations were calculated using the analytical scores from the January and the April assessments. The same process was used with the global scores. The null hypothesis was that the average scores would not change between the January and April administrations, indicating that the test was reliable. The correlation for grades 2–5 was .51; for the eighth graders, the correlation was .62; and for the adults, the correlation was .68, indicating increased reliability among older students.

To test for validity, the LSPI was used in conjunction with a learning-styles instrument called No Sweat that was developed by Tobias and Guild (1986) and based on Gregorc's work. This test also identifies students as global or analytical learners. Tobias and Guild describe a global learner as an individual who sees the big picture, whereas the analytic learner focuses on the parts that compose the big picture. For the LSPI to demonstrate validity, it needed to place a student in the same category as did No Sweat. I used the Spearman rank order correlation coefficient to test validity; in

order for the correlation to be considered significant ($p < .01$), a value of .432 or higher was necessary. The two tests produced a correlation score of .99. We can thus conclude that the LSPI is reliable and valid for students in grades 2–8 and adults and can be used by teachers of these ages with confidence.

Using the LSPI in the Classroom

After teachers administer the LSPI, they record student scores on the LSPI response sheets. Appendix B offers an example of the recorded scores of a real class of preservice teachers that used the instrument. The inventories are then returned to the students to inform them of their particular learning style. Throughout the semester, as questions and comments arise, I explain how teachers can differentiate instruction using global and analytical approaches.

The Dunn and Dunn model (1992) identifies a third category of individuals as *integrated*, a combination of analytical and global. In using the LSPI, I have observed that students who score (analytical-global) 9-6, 8-7, 7-8, or 6-9 are integrated learners and do not require much differentiation of teaching styles. However, individuals who score 10 or above on either the analytical or global side require differentiation. For students with a higher analytical score, instruction must be specific, detailed, logical, and presented in a part-to-whole format to allow students to see how the concept is built. For students with a higher global score, instruction must focus on the big picture. As a teacher, I work to help global students learn how to process information analytically and to help analytical students learn how to process information globally. For example, analytical students can have difficulty giving summations because they want to include all of the details; I therefore help them summarize. Global students tend to overgeneralize and summarize in one sentence, so I help them add details. It is critical for teachers both to teach using their students' preferred learning styles and to help them develop their nonpreferred style skills.

For the class documented in Appendix B, I asked the students who scored 12, 13, and 15 on the global side, "Do you understand?" and had them repeat aloud their understanding in classroom discussion. I need to know if they have processed information appropriately. It is often the students with high global scores who fall behind in their grades. Teachers can spend so much time on details that global learners can fail to comprehend the big picture that they need to process information.

When a student asks a question in the classroom, I glance down at my roll book, in which I also record learning-style preference. If I see that this student has a score of 10 or above on the analytical side, I give an answer with as much specific detail as possible. For example, if this student asks, "How do you want this

report?" I respond, "I want 1.5-inch margins all the way around, 12-point print, and Times New Roman font." My global students, however, care little about these specifications. They want to know what should be emphasized in the content, so if a global learner asks the same question, my response includes a general description of what the assignment should encompass. Both students must produce an appropriate report, but their instruction must be differentiated. Table 2 provides examples of how a teacher could present the same material to both analytical and global learners. In my experience, differentiating between the two produces higher student scores on assignments. The key is to help students achieve a balance of processing information analytically and globally. Students need a teacher's wisdom to ultimately learn to process information in both ways.

Other Benefits of the LSPI

There are several other benefits for teachers using the LSPI besides identifying students as analytical or global learners. Teachers can get a better idea of how to group students compatibly. Not everyone likes working in groups (Dunn and Dunn 1992), so the teacher might decide to allow a very analytical student to work independently. Such decisions may prevent classroom-management problems, as well as allow students to perform more effectively. Second, this knowledge can allow teachers more flexibility in the classroom. For example, if several students prefer to work in a group, the teacher might permit them to do so as long as they meet academic and behavior standards. Grouping or pairing students—sometimes by similar preferences

and sometimes by contrasting preferences—can help teachers promote a balance between analytical and global approaches to learning.

Conclusion

Knowledge of a student's learning style allows me to better answer questions and concerns. A common education saying claims that students don't care how much the teacher knows until they know how much the teacher cares. Using the LSPI shows students that the teacher does care about how the students learn. When a teacher uses this instrument, students infer that the teacher wants to present the material so that all students can be successful in the classroom. Using a teacher-friendly learning-styles instrument in the classroom can help teachers fulfill the mandate that no student be left behind.

REFERENCES

- Campbell, B. J. 1991. Planning for a student learning style. *The Journal of Education for Business* 66 (6): 356–58.
- Curry, L. 1987. *Integrating concepts of cognitive or learning style: A review with attention to psychometric standards*. Ottawa, Canada: Canadian College of Health Service Executives.
- Dunn, R., A. Honigsfeld, and L. Shea Doolan, with L. Bostrom, K. Russo, M. S. Schiering, B. Suh, and H. Tenedero. 2009. Impact of learning-style instructional strategies on students' achievement and attitudes: Perceptions of educators in diverse institutions. *The Clearing House* 82 (3): 135–40.
- Dunn, R. S., and K. J. Dunn. 1992. *Teaching elementary students through their individual learning styles*. Boston: Allyn & Bacon.
- Guild, P. B., and S. Garger. 1998. *Marching to different drummers*. 2nd ed. Alexandria, VA: ASCD.
- Hickcox, L. K. 1995. Learning styles: A survey of adult learning style inventory models. In *The importance of learning styles*, ed. R. R. Sims and S. J. Sims, 25–48. Westport, CT: Greenwood.

TABLE 2. Typical Responses of Analytical and Global Learners

Issue	Analytical learner	Global learner
Questions	Wants answers in specific, detailed terms	Wants answers in terms of the overall goal or purpose of the assignment
Directions	Wants step-by-step instructions and models	Wants to see the end product
Changes in syllabus	Thinking process disturbed, gets confused	Enjoys the break in routine
Introduction of new material	Wants teacher to get to the point	Responds to a story that is relevant, realistic, and personal
Tests	Prefers specific questions, no essays	Prefers open-ended questions, essays
Motivation	Responds to logical appeal	Sensitive to emotional appeal
Presentation of material	Prefers auditory, visual presentation	Prefers visual, tactile, kinesthetic presentation
Criticism	Takes criticism easily	Is bothered by criticism
Involvement	Gets involved in what is being done	Involvement depends on interest and motivation
Best way to learn content	Wants information to be sequential (part to whole)	Wants information in chunks (whole to part)

Hoagies' Gifted Education. 2006-7. Learning and thinking styles. http://www.education.com/reference/article/Ref_Learning_Thinking? (accessed January 23, 2009).

Sarasin, L. M. C. 1999. *Learning style perspectives: Impact in the classroom*. Madison, WI: Atwood.

Sims, R. R., and S. J. Sims. 1995. Learning enhancement in higher education. In *The importance of learning styles*, ed. R. R. Sims and S. J. Sims, 1-24. Westport, CT: Greenwood.

Tobias, C. U., and P. Guild. 1986. *No sweat! How to use your learning style to be a better student*. Seattle, WA: The Teaching Advisory.

APPENDIX A Learning-Styles Preference Indicator

The purpose of this inventory is to determine your preference in how new and difficult material is received, processed, stored, and retrieved. Please respond to all fifteen questions as you would like a situation to be, not necessarily the way you would do something all the time.

Question	A	B
1. Do you like to begin to study by yourself or do you prefer to have an adult or someone else help you get started?	Self	Others
2. Do you prefer to complete one task at a time or do you prefer to have several tasks going at the same time?	One	Several
3. Do you prefer to sit at a desk to study or would you rather sit on a sofa or comfortable chair?	Desk	Sofa
4. Do you prefer to have background noise while you study new and difficult material or would you prefer total quiet?	Quiet	Noise
5. Do you usually have snacks while you study new and difficult material?	No	Yes
6. Do you usually daydream when you are studying new and difficult material?	No	Yes
7. Do you prefer to sit under a bright or dim light when studying new and difficult material?	Bright	Dim
8. Do you prefer to study alone or with others when studying new and difficult material?	Alone	Others
9. Do you prefer to learn new and difficult material by learning it step by step (part to whole) or do you prefer to see the total concept first and then break it down step by step (whole to part)?	Steps	Concept
10. Do you prefer to move about or to stay still when you learn new and difficult material?	Stay	Move
11. Do you prefer to have routine or variety in your daily patterns?	Routine	Variety
12. Do you prefer to doodle while studying new and difficult material?	No	Yes
13. Do you prefer to hear a story to explain a new and difficult concept?	No	Yes
14. Do you consider feedback somewhat or very important when learning new and difficult material?	Somewhat	Very
15. Do you prefer to take short breaks when you are learning new and difficult material?	No	Yes

Total number of answers in the A column _____

Total number of answers in the B column _____

APPENDIX B
Sample Learning-Styles Preference
Indicator Response Sheet

Student	Number of A responses	Number of B responses
Tom	13	2
Stephanie	10	5
Alice	10	5
Flanagan	9	6
Rouche	9	6
Julie	9	6
Lori	8	7
Brandon	8	7
Jackie	7	8
Courtney	7	8
Carol	6	9
Mary	6	9
Tamara	5	10
Judy	5	10
Shea	3	12
Laura	3	12
Sam	3	12
Atiba	2	13
Tracy	2	13
Cindy	0	15

Total number of As (analytical learners for the class): 3

Total number of Bs (global learners for the class): 8

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